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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR        | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/576,468  | 04/20/2006  | Katsumi Yabusaki            | 287117US0PCT        | 7180             |
| 22850 7590 02/19/2010<br>OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                             |                     |                  |
| EXAMINER<br>MAIER, LEIGH C  |             |                             |                     |                  |
| ART UNIT<br>1623  |             | PAPER NUMBER                |                     |                  |
| NOTIFICATION DATE<br>02/19/2010   |             | DELIVERY MODE<br>ELECTRONIC |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/576,468

**Applicant(s)**

YABUSAKI, KATSUMI

**Examiner**

Leigh C. Maier

**Art Unit**

1623

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3-9, 13, 15, 17 and 19-30 is/are pending in the application.
- 4a) Of the above claim(s) 23-28 and 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-9, 13, 15, 17, 21 and 22 is/are rejected.
- 7) ☒ Claim(s) 19, 20 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of the Claims***

Claim 1 has been amended. Claims 1, 3-9, 13, 15, 17 and 19-30 are pending. Claims 23-28 and 30 are withdrawn as being drawn to a non-elected invention. Any objection or rejection not expressly repeated has been withdrawn. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Claim Rejections - 35 USC § 112***

Claims 19-22 and 29 were previously rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Upon further consideration, the examiner is persuaded by Applicant's argument with respect to the limitation "dried," and this rejection is withdrawn.

### ***Claim Rejections - 35 USC § 102***

Claims 1, 3-5, 8, 9, 13, 15, 17, 19-22 and 29 were previously rejected under 35 U.S.C. 102(b) as being anticipated by Pieschel et al (WO 99/28372) with Kroon-Batenburg et al (Glycoconj. J., 1997) to support inherency. Upon further consideration, the examiner agrees with Applicant's interpretation of Kroon-Batenburg, and this rejection is withdrawn.

***Allowable Subject Matter***

Claims 19, 20 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The examiner agrees with Applicant that the Yabusaki declaration presents unexpected results for the product prepared in the manner disclosed therein. That is, a product prepared by treating dried cellulose II with one of the recited phosphorylating agents in the presence of urea.

It is noted that if Applicant amends claim 1 to incorporate the limitations of claim 19, claims 23-25 and 30 would be subject to rejoinder because they incorporate all the limitations of this allowable version of claim 1. Claims 26-28 recite a different process, and it has not been demonstrated that such a process results in a product having the same unexpected benefit. These claims would not be subject to rejoinder.

***Claim Rejections - 35 USC § 103***

Claims 1, 3-5, 9, 13, 15, 17, 21 and 22 are again rejected under 35 U.S.C. 103(a) as being unpatentable over de Magalhaes Padilha et al (Talanta, 1997) in view of Ford et al (US 2,482,755) and Zeronian et al (J. Appl. Polym. Sci., 1980) as set forth in the previous Office action.

de Magalhaes Padilha teaches the use of cellulose phosphate in chromatographic columns for the adsorption of metal ions from aqueous solutions. See abstract, for example. The reference cites the method of Ford in preparing the cellulose phosphate. (The Ford reference cited in this action appears to be the one cited in de Magalhaes Padilha, but the patent number is truncated.)

The cited method treats a cellulose substrate with a phosphoric acid in the presence of urea. See examples. The method does not exemplify a cellulose II product. However, the reference expressly suggests the use of cellulose substrates previously subjected to other processing, such as mercerization. See col 9, lines 46-50.

Zeronian teaches as set forth above. The reference further teaches that mercerization prior to phosphorylation has the beneficial effect of making the cellulose more receptive to the phosphorylating reagents and resulting in a more uniformly phosphorylated product. See page 522, lines 1-3 and paragraph bridging pages 527 and 528.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the metal-adsorbing system of de Magalhaes Padilha by modifying the method of preparing the cellulose phosphate used in said system. The artisan would be motivated to pretreat the cellulose starting material by mercerizing it as suggested by Zeronian in order to make the cellulose more receptive to the phosphorylating reagents and a more uniformly phosphorylated product. One of ordinary skill would reasonably expect success in making this modification. It would be further within the scope of the artisan to optimize the degree of phosphorylation for metal adsorption through routine experimentation. In carrying out the procedure in the presence of urea, the product would be carbamidated.

The claims are recited as product-by-process claims. However, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different

process. In the instant case, Dr. Yabusaki's declaration demonstrates that the cellulose product prepared by a particular method set forth in the specification demonstrates greater metal adsorbing capacity. However, these data are not commensurate with the scope of the claims. The results appear to depend on a particular process of making the product—treating dried cellulose II with one of the recited phosphorylating agents in the presence of urea, as discussed above.

Applicant's arguments filed November 20, 2009, have been fully considered but they are not persuasive.

Applicant argues that Zeronian teaches away from the use of dried mercerized cellulose. The product is not limited by its method of making unless it is shown that that method confers some distinguishing feature upon it. The declaration discussed above demonstrates such a feature, but it is only for a product prepared in by the method discussed above. One might imagine other methods of preparing a carbamidated cellulose II phosphate from dried cellulose II, such as one involving two discrete steps—carbamidation, followed by phosphorylation (as in claim 25). There is no reason to assume that any method starting from a dried cellulose II would necessarily result in a product having the unexpected results disclosed in the Yabusaki declaration. The fact that this combination of references does not teach a product prepared from a dried cellulose II and is distinguished from one prepared by a *particular* method using dried cellulose II, does not prove that it is distinguishable from a product prepared by *any* method using a dried cellulose II.

The rejections set forth below have not been argued separately and are maintained for reasons of record.

Claims 1, 3, 4, 6, 7, 9, 13, 15, 21 and 22 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Reineke et al (US 4,851,120) in view of Zeronian et al (J. Appl. Polym. Sci., 1980) as set forth in the previous Office action.

Reineke teaches that anionic polysaccharides, particularly cellulose derivatives, such as cellulose phosphate, in the form of membranes (or "fabric") have utility for the adsorption of metal ions. See col 2, lines 20-26 and col 3, lines 36-55. The reference suggests the preparation of cellulose phosphate by reacting cellulose with phosphoric acid and urea. See col 3, lines 13-17. The reference further teaches that the membranes may be formed into any desirable shape such as convex, concave or tubular. See col 4, lines 48-55. The reference does not teach the use of a cellulose II phosphate.

Zeronian teaches as set forth above.

It would have been obvious to one having ordinary skill in the art at the time the invention to prepare metal-adsorbing membrane comprising cellulose phosphate by preparing said cellulose phosphate by reacting cellulose with phosphoric acid and urea, as suggested, with the modification of mercerization pretreatment taught by Zeronian. The artisan would be motivated to make said modification in order to make the cellulose more receptive to the phosphorylating reagents and a more uniformly phosphorylated product. One of ordinary skill would reasonably expect success in making this modification. It would be further within the scope of the artisan to optimize the degree of phosphorylation for metal adsorption through

routine experimentation. With respect to claims 6 and 7, the references do not specifically teach the use of the product in the form bag or a cylinder or fabric inside a water storage tank. However, it is noted that a bag could be construed essentially as any non-flat membrane, as suggested by the reference. The reference expressly suggests the treatment of water, so it would be obvious to one of ordinary skill to use the product in an appropriate form in any apparatus where water is processed or stored. In carrying out the procedure in the presence of urea, the product would be carbamidated.

The claims are recited as product-by-process claims. See discussion above.

Claims 1, 2, 4, 8, 9, 13, 15, 21 and 22 are again rejected under 35 U.S.C. 103(a) as being unpatentable over Bernadin (US 3,691,154) in view of Zeronian et al (J. Appl. Polym. Sci., 1980).

Bernadin teaches the preparation of cellulose phosphate using the urea phosphate method, followed by the conversion to an alkali metal salt. See col 2, lines 15-64. The reference does not teach a cellulose II phosphate.

Zeronian teaches as set forth above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to prepare the cellulose phosphate by preparing said cellulose phosphate product by the urea phosphate method, as suggested, with the modification of mercerization pretreatment taught by Zeronian. The artisan would be motivated to make said modification in order to make the cellulose more receptive to the phosphorylating reagents and a more uniformly phosphorylated product. One of ordinary skill would reasonably expect success in making this



modification. It would be further within the scope of the artisan to optimize the degree of phosphorylation for metal adsorption through routine experimentation. In carrying out the procedure in the presence of urea, the product would be carbamidated.

The claims are recited as product-by-process claims. See discussion above.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 1623

***Examiner's hours, phone & fax numbers***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh Maier whose telephone number is (571) 272-0656. The examiner can normally be reached on Tuesday, Wednesday, and Friday 7:00 to 3:30 (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Anna Jiang (571) 272-0627, may be contacted. The fax number for Group 1600, Art Unit 1623 is (571) 273-8300.

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/Leigh C. Maier/  
Primary Examiner  
Art Unit 1623